

Lecture 9: Market anomalies and the Role of Analysts

In this lecture we will be looking in detail at various “anomalies” – apparent exceptions to the EMH – both at a market-wide and individual security level. We then proceed to outline some work that both tries to explain why anomalies arise in the light of analyst and investor behaviour, and assess whether consistent explanations for such anomalies are feasible. Note that we leave aside the possible anomaly of “excess volatility” and its possible link to “herding” by analysts and investors, for the next lecture.

The basic problem of anomalies

Last lecture we already saw some anomalies such as post earnings drift

Review of EMH – prices encapsulate all publicly available information and hence are unpredictable – respond only to new information and follow a random walk. But there are anomalies.

Difficulties in assessing veracity of the EMH

- The magnitude issue – e.g. small excess returns to management skill not detectable by normal statistical methods
- The selection bias issue – if strategy makes money, no one would disclose it
- The lucky event issue – even tossing a coin can get succession of favourable outcomes

Specific market wide anomalies: Non-random returns over different horizons

(Note: financial economics work complementing accounting work in lecture 8)

(1) Underreaction giving scope for technical analysis and growth investing

- Positive serial correlation over weekly periods (Lo and MacKinlay), albeit coefficients small
- Medium term momentum over 3-12 months (Jegadeesh and Titman), not profitable for individual stocks but may be for portfolios of “best performers”

(2) Underreaction giving scope for value investing

- Long term negative serial correlation and fads (Fama and French), stock prices overreact to relevant news,

- giving appearance of fluctuating around fair value (mean reversion)
- Predictability of broad market returns (Campbell and Shiller), e.g. earnings yield can help predict share prices

Review of market wide anomalies

(where $R_m = \Delta \ln SP$)

$$R_m = \mu$$

EMH: returns are random, implying random walk in stock price

$$R_m = \alpha R_{m-1} + \mu$$

Autoregression with positive serial correlation (short term)

$$R_m = -\alpha R_{m-1} + \mu$$

Autoregression with negative serial correlation (medium term)

$$R_m = -\alpha [R_m - R_{mav}] + \mu$$

mean reversion (long term)

$$R_m = \alpha E/P_m + \mu$$

Macroeconomic determinants

Possible reasons for market wide anomalies

Risk premium – variation in risk leads to false inference on mean reversion and excess volatility, while predictors such as earnings yield and bond spread proxy risk premium

Statistical problems – most of the power of tests derives from Great Depression period

Market inefficiency?

Firm-specific anomalies

General problem – results based on certain risk adjustment procedure such as CAPM that may be flawed. Joint tests of EMH and risk adjustment where latter may be wrong.

$$R_i = \alpha + \beta R_m + u + ?$$

- Small firm in January effect whereby small firms have higher return but it all arises in first two weeks of January (Banz). Possible explanation - tax loss selling
- Neglected firm effect (neglected by analysts and investors, hence higher volatility and higher return) - measured by CV of analysts forecasts of earnings (Arbel)

- Liquidity effect, that higher returns compensate for low liquidity of small firm stocks (Amihud and Mendelson) – doesn't explain January
- Book-to-market effects as predictor of returns on cross section of stocks (Fama and French 1992) – more powerful than beta
- Reversal effect as losers rebound and winners fade (DeBondt and Thaler) – stock market overreacts to relevant news and hence contrarian investment profitable

[from earlier lectures]

Post earnings drift...

Some mutual fund performance results...

Possible explanations for firm specific anomalies: (1) common risk factors (Fama and French 1993)

- Suggestion firm specific anomalies may be related
- Estimation of time series factor model on stocks and bonds, measuring sensitivity to market portfolio, to portfolio reflecting size differences and portfolio reflecting book/market (B/M) differences

$$R_i - r_f = \alpha + \beta (R_m - r_f) + \delta \text{SMB} + \gamma \text{HML}$$

- Size and B/M seen as proxies for determinants of risk
- No positive relation of average return to beta once these are taken into account
- Results consistent with efficiency but not CAPM or APT

(2) human capital and cycle omission: (Jagannathan and Wang)

Possibly B/M and firm size anomaly results reflect problems with CAPM

$$R_t = \alpha_1 + \beta_m R_m + e$$

(CAPM)

$$R_t = \alpha_2 + \beta_{\text{prem}} \text{prem} + e$$

(bond yield spread)

$$R_t = \alpha_3 + \beta_{\text{lab}} \text{lab} + e$$

(growth of labour income per capita)

$$E(R_t) = C_o + C_{\text{size}} \ln(MV) + C_m \beta_m + C_{\text{prem}} \beta_{\text{prem}} + C_{\text{lab}} \beta_{\text{lab}}$$

- Assumes all assets traded when human capital is not, and also business cycle affects beta

- When these are included, firm size and B/M drop out

(3): errors by analysts

(a) De Bondt and Thaler

Generalised overreaction by securities analysts, but not clear to what information they overreact

- Regress forecast of earnings on actual earnings growth

$$E_t - E_{t-1} = \gamma + \delta (F_t - E_{t-1}) + e$$

- Forecasts in excess of actual outturns $\delta = 0.65$ (1 year) and $\delta = 0.46$ (2 years). Need to be scaled down to match actual change

(b) Abarbanell and Bernard:

Analysts are responsible for anomalies via forecast errors

- Regress forecast error on last year's earnings change

$$E - F = \alpha + \beta [E_{t-1} - E_{t-2}] + u$$

- If analysts are efficient predictors, no past value should explain errors
- But β is positive – if earnings rising tend to under predict
- i.e. they under react to information in last year's earnings, and act cautiously
- Leaves open puzzle of “generalized overreaction” of DeBondt and Thaler, that AB also found in their dataset

(c) Lakonishok, Schleifer and Vishny:

Systematic errors in the forecasts of market analysts

- Psychological basis – forecasting without full appreciation of reversion – predictions too extreme or permanent relative to past experience
- Hence over optimism about glamour stocks and under valuation of value stocks
- Scope for “Contrarian investment using financial ratios”
- Value stocks outperform glamour stocks over next five years
- For both large and small and for most individual years in sample
- Value stocks performed badly in the past

Ranked shares into 10 portfolios according to ratios. Monitored for next 5 years, for 22 base-years
 Illustration from LSV of glamour and value stocks – growing outperformance.

| Ratio = Book to market (B/M) | Low B/M | High B/M | Difference |
|--|--------------------------|-----------------------------------|------------|
| | Portfolio 1 of 10 | Portfolio 10 of 10 | 10-1 |
| | Most glamorous of stocks | Value stocks, the least glamorous | |
| R_1 (average return over 1968-89, in the 1st year after portfolio formation) | 0.110 | 0.173 | 0.063 |
| R_2 (average return over 1968-89, in the 2nd year after portfolio formation) | 0.079 | 0.188 | 0.109 |
| R_3 (average return over 1968-89, in the 3rd year after portfolio formation) | 0.107 | 0.204 | 0.097 |
| R_4 (average return over 1968-89, in the 4th year after portfolio formation) | 0.081 | 0.207 | 0.126 |
| R_5 (average return over 1968-89, in the 5th year after portfolio formation) | 0.088 | 0.215 | 0.127 |

Key ratios were growth in sales and cash flow to price ratio

Proven that investors predictions are too extreme by comparing actual earnings growth and cash flow with that implied by market valuations

Possible causes:

- short time horizons (so cannot take advantage of contrarian strategy)
- avoiding embarrassment (not liking to take losses while others profit)?

Analysts classify shares as winners and losers and extrapolate in too-extreme long-term forecasts (La Porta)

But also, as noted, under reaction to previous year's earnings (Abarbanell and Bernard)

Background on analysts' performance: Dimson and Marsh: UK analysts' forecasts of returns

Check forecasts of CAPM residuals a year ahead

Optimism – returns predicted 3 times higher than outturns

Caution – variance of forecasts a third of actual variation

Hence, lack of distinction between firms in forecasts (Herding?)

Significant correlation between forecasts and later share price movements, mainly in first few months (although overpredict)

Strong evidence that some analysts show consistent forecasting skills and potential gains from use of composite forecasts

Further behavioural explanations for under and over reaction

Problem of most psychological explanations is that they tend to be mutually inconsistent and ex post (why should there be conservatism in some cases (e.g. short term under reaction) and optimism in others (e.g. medium term overreaction))

A model of investor sentiment
(Barberis, Schleifer and Vishny)

- Distinguish weight (importance) and strength (size) of signals e.g. earnings
- Focus too much on strength (random mistaken for trend)
- And not on weight (trend mistaken for random)
- Under reaction if low strength and high weight signal and overreaction if high strength and low weight signal

Weight depends on time series properties:

Random walk $X_t = X_{t-1} + u_t$ high predictive power of current earnings, signal has high weight

Mean reversion $X_t = \mu + u_t$ low predictive value, more information from mean. Signal has low weight

Trend: positive or negative u_t maintained, information from error

Model: the market follows a random walk, but investors believe there is either a mean reversion (positive shock has low probability of being sustained) or trend (positive shock has high probability of being sustained) Hence investors make false inferences on size and weight of signals

Investor psychology and securities market under and overreaction

(Daniel, Hirshleifer and Subrahmanyam)

Again integrates over and under reaction, using psychological evidence about individual behaviour:

- Individuals are overconfident, and subject to “biased self attribution”
- Overconfidence when tasks need judgment, delayed feedback and undertaken by experts
- Biased self attribution - confidence rises when public information in line with priors, but doesn't fall when it contradicts it (see as bad luck and not signal of low ability)
- Rapid overreaction to private signal followed by slow under reaction to public signal which contradicts it,

suggesting share price too high or low

- Or reinforced overreaction by confirmatory public signal (see diagram), with self attribution bias

Theory suggests post earnings drift is gradual adjustment to previous mispricing rather than an under reaction to earnings announcement

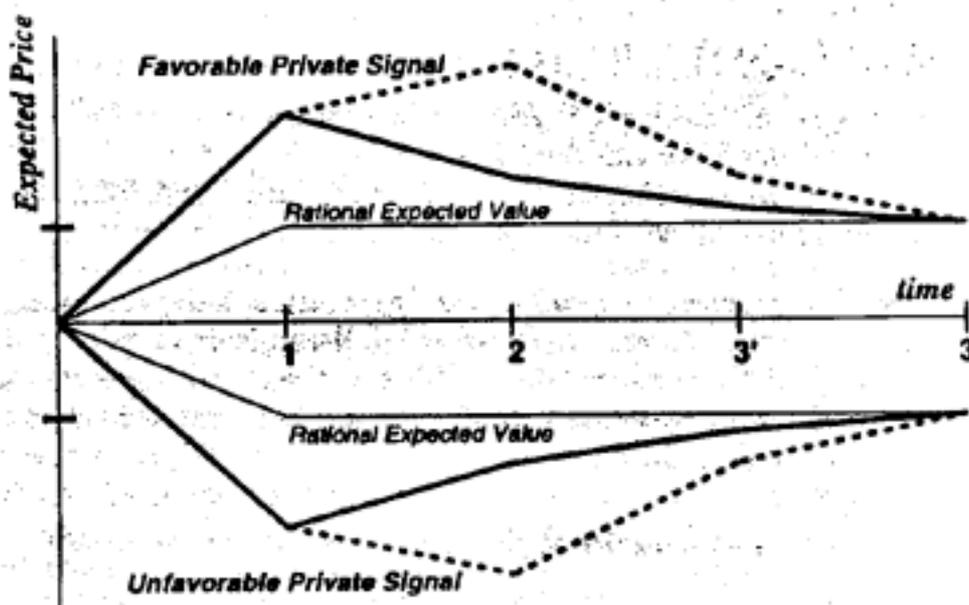


Figure 1. Average price as a function of time with overconfident investors. This figure shows price as a function of time for the dynamic model of Section III with (dashed line) and without (solid line) self-attribution bias.

Time 1, noisy signal misinterpreted so price goes above rational level

Time 2, noisy public signal that partly and slowly dampens optimism

Time 3, unambiguous public signal, cuts price to rational level